DOCUMENT RESUME

ED 152 758 95 SP 012 546

AUTHOR Charters, W.W., Jr.
TITLE The Effects of the Team Organization of Elementary Schools on Teacher Influence and Work Attitudes: A Replication.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Mar 78
NOTE 41p.; Paper presented at the Annual Meeting of the American Educational Research Asscciation (Toronto, Canada, March 27-31, 1978)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Comparative Analysis; *Conventional Instruction; Decision Making; Elementary Schools; Job Satisfaction; Peer Relationship; School Organization; Teacher Administrator Relationship; *Teacher Attitudes; Teacher Behavior; *Teacher Influence; *Team Teaching

ABSTRACT

Two major studies reported in 1970 reached similar conclusions regarding the effect of team teaching in elementary schools on collegial decision making, faculty communication, and teacher sentiments. Among other things, teachers in team-organized schools were found to have higher levels of work autonomy and job satisfaction than those in comparison schools without a team structure. The studies were comparative in design, leaving open the possibility that team organization was not the causal agency responsible for the observed differences. The present paper reports results from a study following a before-after, control group design using measures that strictly duplicated those of one of the prior investigations--the study published by Meyer and Cohen of the Stanford Research and Development Center for Research and Development in Teaching. Measures were taken in the spring of 1974 in 14 elementary schools that subsequently installed a multiunit structure and in 13 control schools that retained an undifferentiated structure, and measures were taken again two years later (as well as in between). Taking account of the "before" levels of the variables, findings showed that the structural innovation had the effects on communication and on teacher imputations of influence to collegial groups described by Meyer and Cohen. The innovation had no effect on job satisfaction, and it reduced rather than increased teachers' feelings of work autonomy. Further analyses demonstrated that the imputed influence of the principal was a vital factor in affecting autonomy, affecting it more strongly than collegial power in the school. (Author)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED152758

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

THE EFFECTS OF THE TEAM ORGANIZATION OF ELEMENTARY SCHOOLS ON TEACHER INFLUENCE AND WORK ATTITUDES: A REPLICATION*

W. W. Charters, Jr.

MITT PROJECT

CEPM

University of Oregon

1978

*Prepared for presentation at the Annual Meeting of the American Educational Research Association, March 27-31, 1978, Toronto, Canada. The research reported herein was supported in part by funds from the National Institute of Education, U.S. Department of Health, Education, and Welfare. Opinions expressed in this report do not necessarily represent the policies or positions of the National Institute of Education, nor should any official endorsement of the report be inferred from the supporting agencies.

SP012 546

THE EFFECTS OF THE TEAM ORGANIZATION OF ELEMENTARY SCHOOLS ON TEACHER INFLUENCE AND WORK ATTITUDES: A REPLICATION

W. W. Charters, Jr.

Around 1970 two major studies conducted at Federal R & D installations independently reported strikingly parallel findings regarding the impact of a team-teaching form of elementary school organization on the governance and work systems of the school and on teacher sentiments. One was the product of the University of Oregon's R & D Center, then called CASEA, and appeared as a series of reports, published and unpublished, by Roland Pellegrin and his associates, while the other had been conducted at the Stanford Center for Research and Development in Teaching by John Meyer and Elizabeth Cohen and their colleagues.[1] The studies, comparative in design, were presented as "exploratory," meaning that their authors considered their conclusions to be tentative--to be taken as provisional hypotheses subject to verification in subsequent research. Both sets of investigators were well aware of the array of alternative explanations of findings possible in studies of comparative design and, in effect, issued invitations to replicate their work under more definitive conditions. The current research, called the MITT Project, was launched in 1973 to do just that.

Of the two, the Stanford study was the more fully reported and the more thoroughly developed in terms of theoretical articulation and the analysis

---

[1] For the main reports of the CASEA work see Dudley, Smith, and Pellegrin (1969), Klausmeier and Pellegrin (1971), Pellegrin (1970a, 1970b), and Pellegrin and Stehr (1971). Stanford's principal report was authored by Meyer and Cohen (1971), but a number of other reports grew out of the work, of which the most relevant to the present investigation were those of Brunetti (1970) and Molnar (1971).

of data. It was also the more firmly grounded empirically, involving over 200 teachers in some 15 elementary schools of the San Francisco Bay area. Pellegrin had focused on six schools in Wisconsin. In this paper we will concentrate on the Stanford study and our efforts to replicate its findings.

The Stanford Study

The Stanford investigation was based on questionnaire replies of classroom teachers in eight "open" schools and seven "self-contained" schools, as Meyer and Cohen called them, in several different districts serving predominantly middle-class, suburban populations. These were K-6 schools ranging in size from roughly 10 to 25 teachers. While the exact procedures for selecting and classifying schools were not described, the investigators characterized the "open" schools as those "in which teachers are organized into formal work teams to plan cooperatively and to conduct instructional tasks in open instructional areas where teaching situations are not separated by floor-to-ceiling partitions," while "self-contained" schools were ones "in which teachers are formally organized to carry out instructional tasks individually and separately in self-contained classrooms" (Meyer and Cohen, 1971, p. 15). The distinction, thus, rested on both an architectural criterion and an organizational criterion--the presence or absence of formally organized "teams." The investigators chose only open schools that had been operating more than a year with formally organized teams, although none had been in that form for more than four and a half years.

Much of the Meyer and Cohen report centered on four clusters of variables measured through the teacher questionnaire.[2]

Task-related interaction (communication). The Stanford investigators asked teachers about the frequency of their informal communication with fellow teachers (individually, in group settings) on six matters related to the teaching task, such as grading students, curriculum planning, student discipline and control, and the like. Summative frequency scores were obtained for individual and for group communication, but the latter was the measure that figured in the main analyses of the report. The questions were repeated for communication with the principal. The frequency scores for this measure were exceptionally low in both types of school, and the authors did not pursue analyses beyond reporting this fact.

Influence of colleagues and the principal in school affairs. Teachers were asked to report the amount of influence various parties exercised over such educational affairs of the school as determining goals and objectives, establishing school rules and regulations, and general curriculum planning. The parties included the school's principal, teacher committees or other groups, and individual teachers. Again, summative scores of influence attributions were obtained for each of the three sources of influence.

---

[2]Numerous other items and measures were included in Stanford's lengthy questionnaire, some of which were used in dissertations, special projects, or various chapters of the principal report. We deal only with those central to the first four chapters of the final report, omitting a cluster of measures concerning teacher evaluation by peers and by the principal. These were not replicated in the MITT study and will not be considered here.

Influence of colleagues and the principal over the teacher's own classroom. Summative scores were also obtained regarding the influence of the three parties over the teacher's own classroom activities, the items now including the teacher's administration of the school rules and regulations, teaching methods, discipline practices, and the like.

Teacher autonomy. One of the questions in the foregoing set asked teachers about their own influence over their own classroom activities. Summed responses over the specific items became Meyer and Cohen's Index of Individual Autonomy.[3]

Job satisfaction. The Stanford group derived a job satisfaction index from five questions concerning satisfaction with the present job, satisfaction with teaching as an occupation, satisfaction with their career choice, and likelihood of remaining in education if offered an attractive position elsewhere. In light of the weighting of the items on the teaching occupation rather than the present job, we prefer to refer to the index as a measure of job-career satisfaction.

Details of the items, response alternatives, and scoring procedures for the measures are given in Meyer and Cohen (1971) and in our own earlier reports (Packard, et al., 1976). Their measures yielded continuous scores, but for

[3]Phrasing of the question seemed awkward to us. Also, considering that the question format and the specific items were identical to the attributed influences questions in which the measure was embedded, artifactually strong relationships might well be expected between it and the attributed influence measures. Consequently, the MITT staff developed a 24-item Sense of Autonomy Scale in a Likert response format, following the conceptualizations of Blauner (1964) and Lortie (1969), and used it in the replication study along with the Autonomy Index. The two measures showed correlations of about .5 in the present investigation.

the purposes of data anlaysis Meyer and Cohen followed the practice of dichotomizing or trichotomizing the score distributions and using cross-tabulation procedures. They relied on contingency table analysis throughout the report.

The fundamental finding of the study was that teachers in the contrasting schools differed markedly on all of these measures. Specifically, teachers in the open schools, compared with those in the self-contained schools:

- had greater frequencies of task-related communications,
- reported greater influence of teacher groups and less influence of the principal on both school affairs and affairs of their own classroom,
- manifested higher levels of work autonomy (in spite of the greater influence of colleagues on their own classroom behavior), and
- exhibited greater job-career satisfaction.

The basic tabulations taken from the Meyer and Cohen report are given in Table 1.

It is worth noting that Meyer and Cohen were surprised by the finding of greater teacher autonomy in the open schools. They had anticipated that the introduction of a team organization and the emergence of group responsibility for the instructional program would rob teachers of their traditional autonomy in the self-contained classroom. The investigators devoted a good bit of time attempting to unravel the paradox, without noteable success.[4]

---

[4] They finally concluded that the Autonomy Index measured different sentiments in the two school settings--or that autonomy took on different connotations for the teachers. This suggestion, however, was based on observations of trends in their contingency tables that cannot be sustained when the tables are subjected to systematic examination. See Footnote 5, below, and the appendix to this paper.

Table 1. Meyer and Cohen Findings: Percentage Distributions for Seven Measures, Comparing Teachers in Open and Self-Contained Schools.

Measure	Category	Open (%)	Self-Contained (%)	Chi-Square[b]
Task-related communication	High	61	21	47.93*
	Medium	25	27	
	Low	14	52	
Teacher group influence on own classroom	High	44	18	
	Medium	37	28	32.66*
	Low	19	54	
Teacher group influence on school affairs	High	39	16	
	Medium	40	23	38.52*
	Low	21	61	
Principal influence on own classroom	High	18	38	
	Medium	46	34	11.42*
	Low	36	28	
Principal influence on school affairs	High	26	40	
	Medium	46	43	7.65*
	Low	29	17	
Autonomy Index	High	86	70	
	Medium	13	21	11.70*
	Low	1	9	
Job-career satisfaction	High	46	28	
	Medium	33	36	8.64*
	Low	22	36	
Number of teachers		(110)	(120)	

[a]Source: Meyer and Cohen (1971), Tables 1, 6, 7, and 9 in Chapter 2.

[b]Our calculations

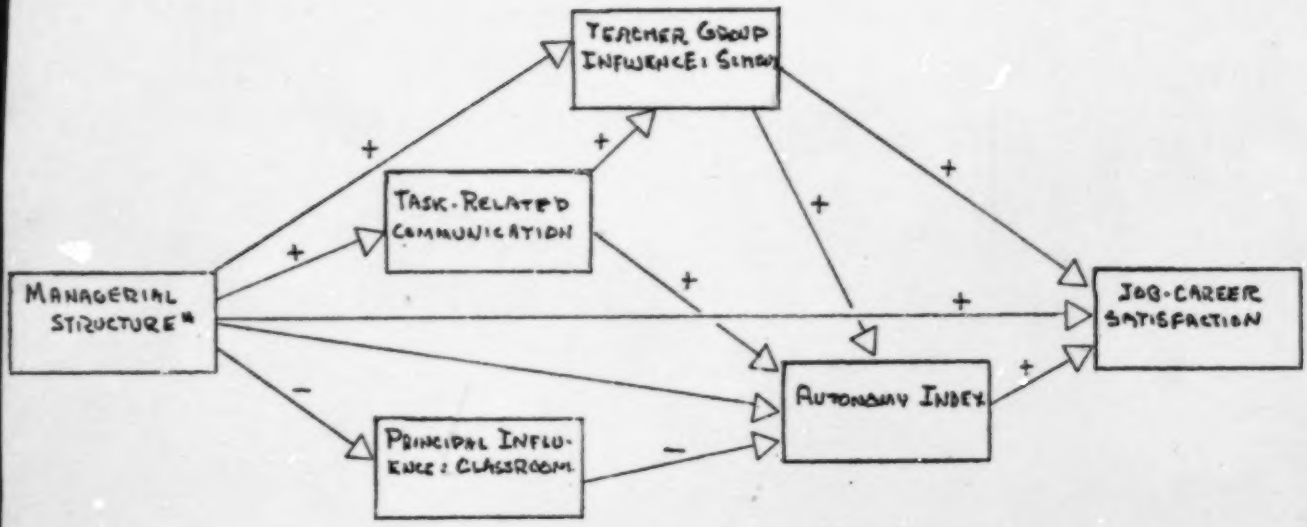
*Significant beyond .05 level, 2 df.

Besides showing these overall differences, the investigators sought to demonstrate how the structural form of the school came to affect teacher sentiments--that is, to specify relationships among the variables. Procedurally, they postulated a causal order among the variables, or at least a selected set of them, and by means of three-way contingency tables examined the association between pairs of variables with a third variable partialled out. For instance, assuming that task-related communication was causally prior to teacher-group influence, they asked whether or not the two were associated when school type was held constant, and, if so, whether or not school type had an effect on teacher-group influence over and beyond that explained by communication. (The answer to both questions was affirmative in this illustration: communication did affect teacher-group influence independently of school type, and school type did have an effect on teacher-group influence in its own right.)

Figure 1 shows the postulated causal order among the selected variables and summarizes the findings. Causal effects, flowing from left to right, are represented by the arrows. Open schools are assigned a higher value than self-contained schools so that a positive relationship between school type and another variable indicates that higher values are found in the open schools. The findings presented in the figure are based on our re-analysis of the contingency tables of the Meyer and Cohen publications using the methodology of log-linear analysis, but the main effects are largely the same as those they reported.[5]

[5] At the time Meyer and Cohen were writing their report, methods for the systematic analysis of multi-dimensional contingency tables and for estimating the magnitude and probability levels of the various effects observed in them were not generally available. Their approach was the standard one of the time: reduce the contingency tables to percentages and inspect the trends by eye. Within the last five or six year, however, such a methodology has been developed by Goodman and others under the general rubric of log-linear analysis, and the MITT Project staff has recently applied the methodology to the published tables of the Stanford study. The principal results are given in Appendix A of this paper

Figure 1. Schematic Representation of Meyer and Cohen's Model of Causal Effects Among Six Variables.



* Open school = 1, Self-contained school = 0.

In brief they proposed that the establishment of a formal team organization in elementary schools alters the instructional arrangement among teachers toward greater collaborative teaching (as indicated by the greater task-related communication) and encourages the development of collegial control over educational decisions of the school and a diminution of administrative control. These changes in the school's work and governance systems, they believed, enhance teachers' feelings of work autonomy, which in turn is a powerful determinant of job-career satisfaction. Their data analysis were largely consistent with this scheme, although there was an important residue of job-career satisfaction and autonomy that could not be explained by the model. Even with other variables controlled, teacher sentiments were still at a higher level in the open schools than in the self-contained schools, a result they were inclined to attribute to a Hawthorne effect.

A note of caution must be injected in viewing Figure 1. Given Meyer and Cohen's contingency table approach together with the relatively small number of cases with which they worked (a total of 230 teachers), only one variable, or at best two, could be controlled at a time. They could not construct tables for examining second- or higher-order partial associations without seriously depleting cell entries. The results of Figure 1, though similar in appearance, are not equivalent to a path analysis in which relationships among all variables of the system are considered simultaneously.

Curiously, Meyer and Cohen devoted relatively little attention in their report to the part played by principal influence in the model--particularly to the manner in which its negative impact on teacher autonomy apparently, as suggested in the figure, offsets the positive effect of influence of the

collegial group. In a sense, of course, this was not a problemmatic issue for them; not only was teacher-group influence higher in the open than self-contained schools, but principal influence was lower in the open schools, both of which operated to enhance teacher work autonomy. Nonetheless, they did not examine the joint operation of the two variables in affecting autonomy, perhaps because of the limitations imposed by their methodological approach. Hence, we do not know the relative magnitudes of their impact nor even whether both would continue to exhibit an effect with the other variable, or school type, controlled. We mention this here because the matter of the principal's influence turned out to be a central consideration in the replication study.

The MITT Project Replication

As mentioned at the outset, the primary intent of the current research was to determine whether or not findings of the Stanford investigation could be generalized to other times and other settings. We wanted to do this in a way that would rule out the most serious alternative explanation of the differences they found between the team-organized and conventional schools, namely that the differences pre-existed in the schools and were not a consequence of the structural form. How we ruled this out will become apparent shortly. For now I can say that we administered questionnaires to 430 regular classroom teachers in 27 elementary schools during the spring of 1976, roughly half of which were team organized (14 of them) and the other half, usually in the same school district, were not. There were 13 of the latter. The return rate of the questionnaires, incidentally, was 97 per cent.

Thanks to the cooperation of Dr. Cohen and others in the Stanford R & D Center, we used precisely the same questions in the questionnaires that they had used to measure the variables we have been discussing. There was one exception. Our measure of task-related communication was of a near-sociometric variety. We asked teachers to indicate, on a sheet listing all classroom teachers in the school, how often they talked to each person about classroom-related topics, and we assigned a frequency score to a teacher only when it was verified, within a particular level of agreement, by the other party. In the analyses we report here, a teacher's communication score consists of sum of the frequencies over all the other teachers with whom he or she talked about classroom affairs. Elsewhere we have referred to this as communication volume.

The criterion on which we distinguished the two sets of schools concerned the shape of the formal managerial structure. In one set the instructional staff was composed into two or more sub-faculties, or units, charged with operating the instructional program for students under their respective jurisdictions. (These units were often called "teams" by the participants.) A leader was officially designated from among the teachers in each unit, and the unit leaders and the principal formed a cabinet responsible for coordinating unit activities and managing affairs not handled by the units independently. You may recognize this as the Multiunit School model outlined by Klausmeier and others of Wisconsin's Research and Development Center for Cognitive Learning. All 14 schools in the set had installed the hierarchically differentiated structure two years earlier--in the fall of 1974. The other 13 schools had no

trace of such a structure, not even functional equivalents of it, nor had there been for at least two years. Their managerial structures were the flat and undifferentiated forms of the conventional elementary school--the instructional staff responsible for students in their own classrooms at one level and the principal at another level, perhaps with the addition of a deputy principal in the larger schools.

We made the distinction a clean one by discarding borderline cases, such as schools that were only partly unitized. The criterion, we must emphasize, concerned formal structure, not role performance and behavior. Whether or not unit members actually met and assumed collective responsibility for the instructional program or whether unit leaders acted as leaders were matters that we could and did measure, but they did not enter into the distinction between the schools.

Needless to say, the two sets of schools differed systematically in other respects as well. Unit organization typically was one part of a bundle of innovations adopted by the staffs of the unitized schools, and teachers were engaged in implementing a diverse assortment of instructional and curricular reforms, including, in some of the classrooms, IGE instructional materials from Wisconsin. In contrast, no school-wide programs of innovation existed in the nonunitized set of schools, although individual teachers or small groups of them here and there were experimenting with new methods and materials. By and large, teachers in the unitized schools were younger, less experienced, and more progressive in their educational outlooks than their companions in the nonunitized schools, a difference corresponding to the one Meyer and Cohen

had observed between their open and self-contained schools. Unlike the schools of the Stanford study, though, where architectural style was one of the bases for selection, our schools did not differ strongly with respect to open space. None of the unitized buildings were entirely of an open space construction, and only a handful had additions built in that style.

Taking the two sets of schools together, they were considerably more heterogeneous than the schools studied by the Stanford investigators. All lay east of the Mississippi River, principally in the New England, Mid-Atlantic, and Border states. Some were inner-city schools serving low-income families, others were in affluent and not-so-affluent suburbs, and still others were essentially rural. Included were parish schools of a Roman Catholic diocese, although most were public schools. Grade organization was variegated as well: several included the seventh and eighth grades, and some were essentially primary schools. They ranged in size from a faculty of eight serving 200 students to 30 classroom teachers serving over 800 students. The sample was not random but it was clearly diverse.

Results

In compiling responses to the teacher questionnaire we followed the scoring procedures of the Stanford study, but we preserved the scores in continuous form to facilitate the use of multivariate data analysis techniques. The results we now report use the individual teacher as the unit of analysis. Although a case can be made for aggregating teacher responses for school means and using the school as the analysis unit, particularly where teacher

responses are presumed to be indicative of a school characteristic, like the influence of the principal or of the collegial group, we wished to remain faithful in this report to the approach of the original study.

Table 2, showing the mean teacher scores for the unitized and nonunitized schools, reveals some similarities but also some important differences from the findings of the Meyer and Cohen study in the San Francisco Bay area schools six years earlier. As they had observed, the volume of classroom-related communication and the amount of influence attributed to the collegial group was greater in the unitized than nonunitized schools. Also, the unitized principals' influence over school affairs was below that of the nonunitized principals, but reports of the principal's influence on the teacher's classroom did not differ between the two sets of MITT Project schools. Nor did the level of job-career satisfaction of teachers.

A significant difference appeared between teachers on the work autonomy index, but it was in the opposite direction from what the Stanford investigators had reported. Index values were lower in the team organized schools than the conventional schools. This accords better with the original expectations of the Stanford group and appears to resolve the paradox.

Before taking these observed differences too seriously, though, we need to answer another question: How confident can we be that the greater communication and collegial influence and the lower work autonomy of teachers in the unitized set was the consequence of team organization rather than antecedent to it? How do we know that the differences did not exist before the schools undertook their structural and other innovations?

Table 2. MITT Findings: Means and t Tests for Seven Measures, Comparing Teachers in Unitized and Nonunitized Schools, Spring 1976 ("After").

Measure	Unitized	Nonunitized	t
Classroom-related communication (MITT measure)	15.62	11.45	5.263*
Teacher group influence on own classroom	2.80	2.45	4.279*
Teacher group influence on school affairs	3.02	2.79	2.776*
Principal influence on own classroom	3.00	3.05	.604
Principal influence on school affairs	3.67	3.84	2.433*
Autonomy Index	3.85	4.00	2.301*
Job-career satisfaction	18.03	18.32	.883
Number of teachers	(208-215)	(193-198)	

*Significant beyond .05 level, two-tailed test.

The MITT study was planned so that data would be available to answer the question. Just two years earlier, in the spring of 1974, the MITT staff had obtained measures on the same variables in the 27 schools.[6] This occurred shortly after the faculties of one of the sets of schools had expressed the intention of implementing several curricular innovations, including the unitized managerial structure, beginning in the coming fall but before any structural changes had been instituted. At most, the faculties had met and agreed upon undertaking the innovative program and had begun some preparatory workshops and planning for the fall by the time the "pre" measures were taken, but any school that showed signs of having begun to implement the innovations that spring were dropped from consideration. Faculties in the other set, the nonunitized schools, had expressed no such innovative intentions, nor was anything comparable to a unitized structure installed in them in the succeeding fall--or any time later, for that matter.

The analyses of the "before" and "after" measures that we are about to report are based on the cohort of teachers who had been in the schools (and furnished questionnaire responses) at both points in time. Given normal staff turnover during the two intervening summers, the cohort represented approximately two-thirds of the original staff complement, a figure that was about the same in the unitized and nonunitized schools. The total complement of the cohort was 242. The effective number of cases was somewhat less than that, depending

---

[6] In fact, we obtained measures on these and other variables at six-month intervals during the following two school years. In other reports we allude to the data-taking waves as T_1, T_2, etc. The "after" measures discussed above refer to T_5.

on incomplete responses to various questionnaire items. Our analytical procedure was the regression approach to the analysis of covariance. "After" values of a variable were regressed onto the managerial structure variable, coded 1 for unitized schools and 0 for nonunitized schools, following their adjustment for the level of the "before" values. The regression was accomplished in a stepwise fashion so that a significance test could be made of the increment in the variance explained by unit organization over and beyond the variance explained by the autocorrelation.[7] We also entered an interaction term as a third step in the regression procedure in order to check for inhomogeneity in estimated slopes of the regression lines; this term was the product of the "before" values and the dummy-coded managerial structure variable.

Table 3 summarizes the results. The greater volume of task-related communication in the unitized schools suggested in the preceding table was a dependable effect of the implementation period. Teachers clearly were talking more among themselves about matters concerning classroom teaching in the spring of 1976 than they had been in 1974. We might note, though, that the communication increase was not confined to classroom-related matters. Using our near-sociometric procedure we had also asked teachers about their communication with fellow teachers on school-related topics and on matters "unrelated to schools or teaching," Similar analyses, not reported here, showed an even stronger effect of unit organization on school-related communication but no effect at all on communication of the more sociable variety.

---

[7]The relevant F test is found in Kerlinger and Pedhazur (1973, pp. 178f.).

Table 3: MITT Findings: Effects of Managerial Structure on Seven "After" Measures, Controlling for Value of "Before" Measures.

Dependent ("After" Values)	Independent	Effect[a]	R^2	R^2 Increment	F	df
Communication	"Before"		.191	--		
	Structure	+	.231	.040	12.015*	1/234
Teacher Group:	"Before"		.087	--		
Classroom	Structure	+	.119	.032	7.931*	1/215
Teacher Group:	"Before"		.100	--		
School	Structure		.112	.012	2.841	1/215
Principal:	"Before"		.222	--		
Classroom	Structure	?	.222	.000		
	Interaction		.254	.032	9.451*	1/226
Principal:	"Before"		.121	--		
School	Structure	?	.135	.014		
	Interaction		.156	.021	5.856*	1/230
Autonomy	"Before"		.094	--		
	Structure	-	.112	.018	4.675*	1/228
Job-Career	"Before"		.445	--		
Satisfaction	Structure		.446	.001	.431	1/209

[a]Unitized schools coded 1, nonunitized coded 0. A + indicates positive effect of unit organization, - indicates a negative effect of unit organization, ? indicates an indeterminent effect by virtue of a significant interaction.

*Significant at or beyond .05 level.

Influence attributed to teacher groups over the teacher's own classroom performance was also a dependable effect, but the influence of collegial groups over school-wide affairs was not. Insight into the "disappearance" of this latter effect as a result of the cohort analysis can be gained by considering attribution scores of teachers who did and did not remain in the schools over the two-year period. The data are given in Table 3A. In the innovative schools, there was a marked inclination for teachers who attributed little influence to teacher groups to leave the schools between 1974 and 1976 and to be replaced by teachers who attributed considerable influence to them. Those who remained in the schools continued to see collegial groups as influential. Thus, the difference shown in the cross-sectional analysis in Table 2 was the product of selective retention and recruitment of teaching staffs, not changes in the views of individual teachers. No such pattern of staff selection occurred in the control schools.

A significant interaction appeared in the analyses of principal influence, precluding a straightforward interpretation. Regression slopes of the "after" values of principal influence scores on the "before" values differed between the two sets of schools. Closer inspection of the data revealed that the "after" values were strongly predicted from the "before" values in the control schools ($r = .63$), but only poorly so in the unitized schools ($r = .27$). Some principals of the unitized schools were said to have increased or maintained their previous levels of influence, while others were said to have lessened their influence--to have withdrawn from involvement in classroom and school affairs. We will return to this apparent disruption of normal administrative relationships shortly.

Table 3A

Selective Retention and Recruitment of Teaching Staffs with Respect to the Measure of Teacher Group Influence over School Affairs: MITT Unitized Schools

	Teacher Group Influence: School		
Teacher	Mean	S.D.	N
Departing, 1974 Score	2.79	.832	68
Replacement, 1976 Score	3.06	.848	96
Remaining, 1974 Score	3.06	.829	113
Remaining, 1976 Score	2.98	.832	115

With respect to the Index of Autonomy, the lower "after" values for teachers of the unitized schools shown in Table 2 were bona fide effects of the change in managerial structure. Although the socres were lower among

the unitized teachers than the nonunitized teachers to begin with, they declined even further as a consequence of the intervening events associated with the structural alteration.[8] No effect was found at all for the measure of job-career satisfaction. Notable in Table 3 is the high stability of the auto-correlation over the two-year period--a value corresponding to a correlation coefficient of .67. Perhaps it is not surprising that transitory events occurring in the schools during a few years have little consequence for satisfaction with one's career choice, as reflected in the Stanford measure.

With the basic data in hand, and the variables retained in continuous form, it was possible to test fully the causal model proposed by Meyer and Cohen explaining the manner in which the school's structural form affects teacher sentiments. Using 380 cases measured at the "after" point in time, T_5, multiple regressions were performed to estimate path coefficients for the model shown in Figure 1.[9] The equations of the model, expressed in standardized values of the variables, are as follows:

---

[8] This is one point at which MITT's Sense of Autonomy scale yielded a basically different finding from Stanford's Index of Individual Autonomy (see Footnote 3). Our 24-item scale also revealed lower autonomy values for the unitized schools at both measurement points, but the regression analysis failed to show a significant or even near-significant effect of the managerial structure variable.

[9] Analysis were also conducted using the T_1 and T_3 data with results virtually identical to those presented here. An additional set of analyses was performed to test for violations of the assumption of uncorrelated error terms. In these analyses T_5 dependent variables were regressed on T_4 independent variables, lagged six months but within the same school year. Comparisons of standardized and unstandardized b coefficients between the lagged and the synchronous regressions showed only trivial and unsystematic differences--typically in the third decimal place. Our results do not appear to have been distorted by correlations, if any, of the error terms.

$$Z_2 = p_{21}Z_1 + p_{2s}Z_s$$

$$Z_3 = p_{31}Z_1 + p_{3t}Z_t$$

$$Z_4 = p_{41}Z_1 + p_{42}Z_2 + p_{4u}Z_u$$

$$Z_5 = p_{51}Z_1 + p_{52}Z_2 + p_{53}Z_3 + p_{54}Z_4 + p_{5v}Z_v$$

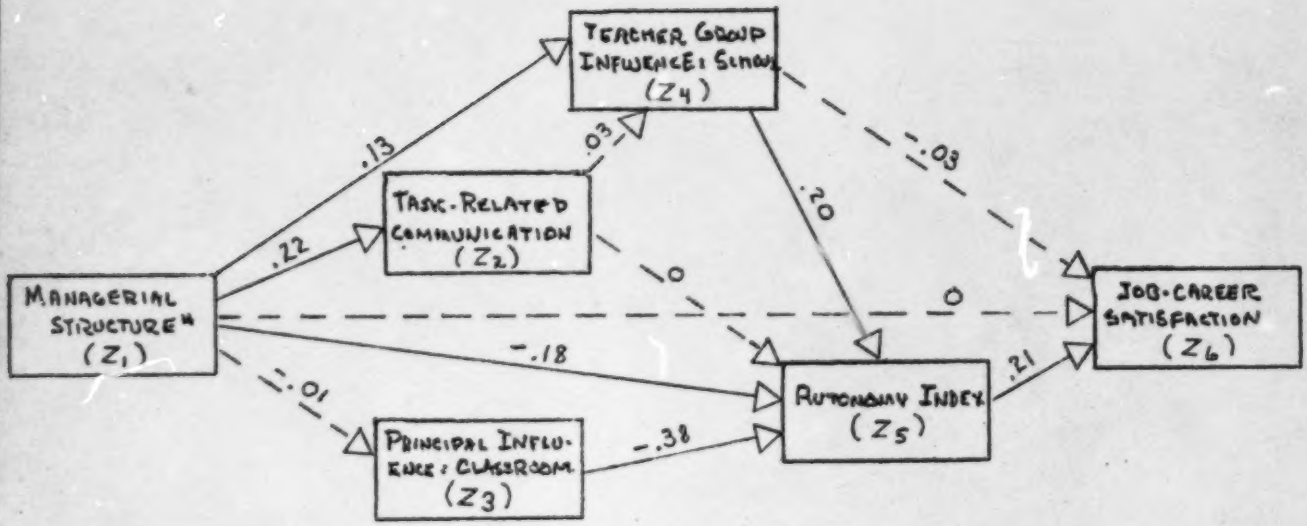
$$Z_6 = p_{61}Z_1 + p_{64}Z_4 + p_{65}Z_5 + p_{6w}Z_w$$

where the p's represent the respective path coefficients, Z_1 through Z_6 the respective standardized scores for Managerial Structure (dummy coded), Communication, Principal Influence on Classroom, Teacher-Group Influence on School, Autonomy Index, and Job-Career Satisfaction. The letters s through w represent their respective error terms.

Figure 2 presents the findings in schematic form. Solid arrows indicate paths with statistically significant coefficients (at the .05 level, by the F test) and the dashed arrows the nonsignificant paths. The error terms are omitted from the diagram. Zero-order correlations are given in Table 4 and the path coefficients in Table 5.

It is obvious that the shape of the causal system is different from that proposed by the Stanford investigators (see Figure 1). For one thing, direct paths from the exogenous variable, managerial structure, to job-career satisfaction and principal influence are missing and the path to the autonomy index is negative rather than positive--matters anticipated in the previous discussions. The effect of collegial-group influence on job-career satisfaction, independently of autonomy, is also missing in the MITT sample. All its effect is mediated by autonomy.

Figure 2. Path Coefficients for Meyer and Cohen's Model of Causal Effects Among Six Variables.



* Open school = 1, Self-contained school = 0.

Table 4

Correlations, Means, and Standard Deviations of Variables in the Meyer and Cohen Model, MITT Data at T_5

(N = 380)

Variables		2	3	4	5	6	Mean	S.D.
1	Managerial Structure*	.216	-.010	.125	-.153	-.041	.51	.500
2	Task-related Communication		-.039	-.008	-.026	.049	13.46	7.815
3	Principal Influence: Classroom			.081	-.362	-.024	3.01	.745
4	Teacher Group Influence: School				.151	.005	2.91	.838
5	Autonomy Index					.206	3.91	.639
6	Job-career Satisfaction						18.13	3.310

*Code: Unitized = 1, nonunitized = 0.

Table 5

Path Coefficients for Meyer and Cohen's Reduced Model,

MITT Data, T_5

(N = 380)

Dependent Variable	Independent Variable Z_1[a]	Z_2	Z_3	Z_4	Z_5	Z_6	R^2
Z_2 Communication	.216*						.047
Z_3 Principal: Classroom	-.010						.000
Z_4 Teacher Group: School	.133*	-.033					.017
Z_5 Autonomy Index	-.182*	.000	-.380*	.204*			.169
Z_6 Job-career Satisfaction	-.001			-.026	.208*		.043

[a]Managerial Structure: Unitized = 1, nonunitized = 0.

*Significant beyond .05 level

A key difference is that task-related communication, as measured in the MITT study, plays no part in the causal nexus. The amount of teacher-to-teacher communication about affairs of the classroom has no bearing on either the level of teacher-group influence or teacher feelings of work autonomy. If task-related communication is regarded as a reflection of intimate teaching relationships among teachers, as Meyer and Cohen were inclined to do, these findings suggest that work arrangements in the school do little to determine the teacher sentiments under consideration and are unconnected with the character of the school's governance system, as represented by teacher reports on the influence of collegial groups and the principal. These observations are largely consistent with other findings of the MITT study, where direct measures were taken of instructional arrangements and decision-making structures of the school.

Results of the path analysis, though, correspond with the Stanford findings in regard to the substantial impact of teacher autonomy on job-career satisfaction and in regard to the counterposing effects on autonomy of the two attributed influence variables. The figure shows a positive, autonomy-enhancing effect of teacher-group influence over school affairs and the negative, autonomy-reducing effect of the principal's influence over the teacher's own classroom performance.[9a] In the present analyses, moreover, we can gain an impression of the relative strengths of these opposing forces. The beta weights indicate that one standard deviation increment in the principal's attributed influence has double the impact on teacher autonomy as a similar increment in the level of influence attributed to collegial groups over affairs of the school.

(Footnote 9a next page)

[9a] Interestingly, the influence of the teacher group over classroom affairs did not have the same autonomy-reducing effect as the principal's influence did. Teacher Group Influence: Classroom, when included in the regression equation, made no significant contribution to the prediction of teacher autonomy. Teachers apparently did not view encroachments by peers on their teaching activities as a threat to autonomy.

If this were generally true beyond the present sample, it would suggest that differences in teacher sentiments among comparison elementary schools would depend upon the particular mix of collegial-group operations and administrator behavior found in them, with the behavior of the principal being the more important factor in the mixture. Where the open schools of the Stanford study had strong collegial-group influences reported for them and little principal interference in classroom affairs, at least in comparison with the self-contained schools of the study, high levels of autonomy and job-career satisfaction would be expected to follow.

Interestingly, as far as we can determine by the data of the Meyer and Cohen report, an important difference existed between the control schools of the two studies with respect to the mix of forces. In particular, principal influence over the classroom appears to have been substantially greater in the self-contained schools of the Stanford study than in the nonunitized schools of the MITT investigation. (Levels of collegial-group influence were not much different.) The happenstance of their control schools, thus, favored their findings. This is a hazard inevitably built into studies of a strictly comparative design.

In light of the centrality of the administrator's role in understanding teacher sentiments, it is of some moment to explore further the differential behavior of the principals in MITT's unitized schools. We have pointed out that as the staffs of the 14 schools sought to implement the structural and curricular innovations some principals were perceived to have maintained or even increased their influence over internal affairs of the classroom while

others were seen to withdraw from such involvement. Our efforts to account for the differential behavior are still incomplete, but there is tentative evidence indicating that the course of innovation was quite different depending on the size and complexity of the schools in question and upon the type of principal who characteristically inhabited them at the time of adoption. Briefly, it seems that it was the thrustful, paternalistic principals of the small and simple elementary schools who were most likely to withdraw from the scene.[10] Principals of the larger and more complex organizations, who might be conceived more in the role of school managers, seem to have altered very little their reported behavior vis-a-vis the teachers' classrooms. We must leave a report of the evidence aside, pending completion of our analyses.

Discussion and Conclusions

Evidence of the present study partly supports and partly disconfirms findings of the pioneering investigation of the Stanford R & D Center in the early 1970's. Task-related communication clearly increased as a consequence of the curricular and structural innovations among the "experimental" schools of the MITT replication, and teacher reports of the influence of colleagues and administrators changed too, although not as consistently or unconditionally as the earlier investigation had suggested.

---

[10] Maternalistic would be a better characterization of these principals, since they were predominantly female. The distinction between schools on the basis of organizational and principal types is referred to in the following papers as "domains of administrative responsibility."

Teacher sentiments, however, were either unaffected or affected in a direction opposite to the previous findings by the particular innovations in the MITT sample. Job-career satisfaction of teachers seemed impervious to change by virtue of events during the two years. The negative impact of the events on the Index of Individual Autonomy, while contrary to the findings reported by Meyer and Cohen, are certainly more in keeping with their original expectations.

However, we have some reservations about even this negative impact on autonomy, based on other evidence of the study. For one thing, no parallel pre to post change was found when scores were aggregated for staff means on the Autonomy Index and data were analyzed at the school level. For another thing, no changes were detected at either the individual or school level of analysis using the separate Sense of Autonomy Scale included in the MITT questionnaire.[11] This scale was included to allay our concern that the Autonomy Index, so firmly embedded in the attributed influence format of the questionnaire, would merely reflect the responding teachers' "psycho-logic" regarding the influence process. The evidence suggests that it may have.

Perhaps the most significant extension of the Stanford research has been our specification of the centrality of the principal's role in the linkage

---

[11] See Footnotes 3 and 8. The analyses alluded to in this paragraph will be included in the final project report, currently in preparation.

We should add that the two autonomy measures performed similarly in the path analyses we reported above, except that coefficients representing relationships between autonomy and the measures of attributed influence were consistently lower when the Sense of Autonomy Scale was substituted for the Stanford Index of Individual Autonomy.

of the school's governance system to teacher sentiments. Meyer and Cohen had concentrated on the emergence of collegial groups of teachers, but our data indicate that the import of these groups takes second place to the principal-teacher relationship and that the two must be seen in the context of one another. Indeed, it may well be that discrepancies in the findings of the two studies with respect to teacher sentiments hinge on the particular mix of the two factors in the schools under investigation.

Other explanations for the discrepancies can be entertained as well. The times were different, the schools were different, in geographical location if nothing else, and undoubtedly the structural and curricular innovations underway in the "experimental" schools of the studies were not the same. These explanations, of course, can never be assessed. They only speak to the limited generalizability of the original findings.

Perhaps the changes envisioned for the unitized schools of the MITT sample were never in fact implemented and this accounts for the non-effects on teacher sentiments. After all, the evidence we have reported regarding changes in the micro-governance systems of the unitized schools were based solely on pooled perceptions of teachers--impressions of the environment--and we have reported no direct evidence at all regarding changes in the work organization of the schools, only changes in the amount of teacher talk about work. But we do have direct evidence indicating that distinct changes occurred in both the governance and work systems of the unitized schools. In particular, the unitized schools changed dramatically toward greater task interdependence in teaching arrangements, as measured by logs that teachers kept of their

instructional contacts with pupils during sample two-week periods. They changed equally strongly in regard to collegial control of educational decisions of the school. Lengthy interviews with knowledgeable informants in each school that probed the details of numerous specific decisions revealed unequivocal shifts in the proportion of decisions made exclusively by teacher groups. Thus, our relatively "hard" data demonstrate that key features of the innovation were in place.

(This last, I must interject, is an "on-the-average" statement. There were marked variations among the unitized schools in the extent of the changes, and the purpose of another facet of the MITT investigation, discussed in the next paper, was to attempt to account for the difference in implementation histories.)

Finally, one of the findings we have described here, concerning the absence of an impact of task-related communication among teacher on teacher-group influence levels (or other influence measures, for that matter) fits in with a larger implication of the MITT data. In general, we have found rather few connections between our indicators of teaching arrangements at the classroom level and indicators of the school's governance system. I will not assemble the relevant observations in this paper, but our various analyses seem to add testimony to the idea, expressed most recently by Cohen (1978), that classroom teaching and school management are "loosely-coupled" phenomena. The exact location of the coupling, whether loose or otherwise, is an important arena for further investigations into the organizational form of schools.

References

Blauner, R. Alienation and Freedom: The Factory Worker and His Industry. Chicago: University of Chicago Press, 1964.

Brunetti, J.A., Jr. The teacher in the authority structure of the elementary school. Unpublished doctoral dissertation, Stanford University, 1970.

Cohen, E. Coordination, control and facilitation of instruction in schools. Working paper prepared for the National Institute of Education Conference on School Organization and Effects, San Diego, Calif., January, 1978.

Davis, J.A. Hierarchical models for significance tests in multivariate contingency tables: An exegesis of Goodman's recent papers. In H.L. Costner (Ed.), Sociological Methodology, 1973-74. San Francisco: Jossey-Bass, 1973. Chapter 8.

Dudley, C.J., Smith, K.F., and Pellegrin, R.J. The decision-making structure of schools. Paper presented to the annual meeting of the American Educational Research Association, 1969.

Kerlinger, F.N., and Pedhazur, E.J. Multiple Regression in Behavioral Research. New York: Holt, Rinehart and Winston, 1973.

Klausmeier, H.J., and Pellegrin, R.J. The Multiunit School: A Differentiated Staffing Approach. In D.S. Bushnell and D. Rappaport (Eds.), Planned Change in Education. New York: Harcroft Brace Jovanovich, 1971. Chap. 8.

Lortie, D.C. The balance of control and autonomy in elementary school teaching. In A. Etzioni (Ed.), The Semi-Professions and Their Organization. New York: Free Press, 1969. Chapter 1.

Meyer, J., and Cohen, E. The Impact of the Open-Space School Upon Teacher Influence and Autonomy: The Effects of an Organizational Innovation. Technical Report No. 21, Stanford Center for Research and Development in Teaching, 1971.

Molnar, S.R.F. Teachers in Teams: Interaction, Influence and Autonomy. Technical Report No. 22, Stanford Center for Research and Development in Teaching, 1971.

Packard, J.S., Carlson, R.O., Charters, W.W., Jr., Moser, R.H., and Schmuck, P.A. Governance and Task Interdependence in Schools: First Report of a Longitudinal Study. Eugene, Ore.: Center for Educational Policy and Management, University of Oregon, 1976.

Pellegrin, R.J. Professional Satisfaction and Decision Making in the Multiunit School. Technical Report No. 7, Center for the Advanced Study of Educational Administration, University of Oregon, 1970a.

Pellegrin, R.J. Some Organizational Characteristics of the Multiunit School. Technical Report No. 8, Center for the Advanced Study of Educational Administration, May, 1970b.

Pellegrin, R.J., and Stehr, N. Idiosyncratic specialization and causal interdependence in elementary school teaching. Paper presented to the annual meeting of the Pacific Sociological Association, 1971.

Appendix A

As reported in the text and Footnote 4, Meyer and Cohen sought to resolve the paradoxical findings with respect to teacher autonomy by arguing that autonomy took on different connotations for teachers in the open and the self-contained settings. Specifically, they proposed that to teachers in the conventional setting autonomy meant freedom from external interference, while to those in the open schools it meant broadened personal control over conditions limiting their work performance. Evidence sustaining this interpretation hinged on what the investigators took to be signs of interactive relationships in their contingency tables--signs in particular that the relationship between the autonomy measure and another variable, such as the principal's influence over the teacher's classroom, was of a different magnitude or direction in open as compared with self-contained schools.

Some of the signs of interaction were not as apparent to us as to the report authors. Contingency tables of a higher order than the familiar two-way relationships, of course, are notoriously difficult to interpret, especially as the cell entries on which percentages are based begin to vanish, as in some of Meyer and Cohen's tables. With recent developments in methodology of multi-dimensional contingency table analysis, the MITT staff was able to re-examine the tables, or at least the ones most relevant to the replication study, presented in the Meyer and Cohen report. The methodology we followed is largely due to the sociologist, Leo Goodman, and concisely explained by Davis (1973). Our re-analysis was facilitated

by the CONTAB computer program developed by Solomon Kullback, C.T. Ireland, John Nolan and others, and available from the Department of Statistics at George Washington University.

While our attention centered on the second- (and third-) order interactions claimed by Meyer and Cohen, we were also interested in testing the main effects thay had reported. Table A1 summarizes the results for the particular tables we re-examined or the tables that were relevant to the replication study. The Information Statistic shown on the right is given by the log-linear analysis and is evaluated by the Chi-square distribution, with the degrees of freedom indicated in the last column. The base hypothesis for the main effects tested in the procedure was the single-variable effect for the table: (A) (B) (C) or (A) (B) (C) (D), in Davis' symbolization, where A, B, C, and D represent the three (or four) variables of the table. A test of second-order interaction in the three-way tables was obtained by fitting the model, (AB)(AC)(BC). The second- and third-order interactions for the four-way table were more complicated. The base hypothesis for the second-order interactions was of the form (AB) (AC) (AD) (BC) (BD) (CD), while the third-order interaction was tested by fitting (ABC) (ABD) (BCD) (ACD).

Results

None of the tables displayed a significant second-order interaction. This means that the "signs" on which the investigators rested their case for their interpretation of autonomy did not materialize. This includes the interactive effect of school type and principal influence on autonomy.

Table A1

Test of Selected Tables of the Wever and Cohen Report[a] by Log-Linear Analysis

Chapter-Table	Page	Variables:[b] Dependent/Independent	Claimed Finding	Test Result[c]	Information Statistic	df
3-1	61	AUTONOMY/				
		STRUCTURE		+	11.86	1
		YRSTCHR		0	2.79	1
		Interaction	+	0	.40	1
3-2	64	JOBSATIS/				
		STRUCTURE		+	10.94	1
		AUTONOMY		+	8.90	2
		Interaction	+	0	2.13	2
3-3	67	JOBSATIS/				
		STRUCTURE		+	12.61	1
		YRSTCHR		0	3.07	2
		Interaction	+	0	2.54	2
4-1	73	JOBSATIS/				
		STRUCTURE	+	+	10.94	1
		TCHGPSC	+	+	6.51	2
4-2	74	AUTONOMY/				
		STRUCTURE	0	+	5.90	1
		TCHGPSC	+	+	30.99	2
4-3	77	JOBSATIS/				
		STRUCTURE	+	+	10.94	1
		TCHGPSC	+	+	9.25	1
		AUTONOMY	+	+	9.35	1
		Interactions				
		TCHGPSC conditional on STRUCTURE	+	0	.07	1
		AUTONOMY conditional on STRUCTURE	+	0	.87	1
		Third order interaction	+	0	.05	1
4-4A	79	AUTONOMY/				
		STRUCTURE		+	11.30	1
		PRINCCL		-	5.17	1
		Interaction	+	0	1.59	1
4-4B	79	JOBSATIS/				
		STRUCTURE	+	+	d	
		PRINCCL	0	0		

Table A1 (cont.)

Chapter-Table	Page	Variables: Dependent/Independent	Claimed Finding	Test Result	Information Statistic	df
4-5A	83	TCHGPSC/				
		STRUCTURE	+	+	14.72	1
		COMMUN	+	+	26.34	2
4-6A	84	AUTONOMY/				
		STRUCTURE		+	5.90	1
		COMMUN		+	10.60	2
		Interaction	+	0	1.58	2
4-7A	36	JOBSATIS/				
		STRUCTURE	+	+		
		COMMUN	0	0	d	

[a] Meyer and Cohen (1971).

[b] STRUCTURE = Open Schools (coded 1), Self-contained Schools (coded 0).
AUTONOMY = Autonomy Index
PRINCCL = Principal Influence on the Individual
TCHGPSC = Teacher Group Influence within the School
COMMUN = Task-related Interaction (Communication)
JOBSATIS = Job Satisfaction
YRSTCHR = Years of prior teaching experience

[c] A + indicates a significant effect (by the Information Statistic) at or beyond the .05 probability level; 0 indicates a nonsignificant effect. The - symbol for the main effect in Table 4-4A indicates a significant negative relationship. Otherwise, all main effects are positive.

[d] Not tested. The effect of COMMUN was patently not significant.

The main effect of principal influence on teacher autonomy was significant, inspection indicating that the effect was a negative one.

All of the main effects claimed by the investigators did materialize. Another must be added, however. In each of the three-way tables implicating school type and autonomy, teachers in open schools manifested higher levels of autonomy than those in self-contained schools, holding constant principal influence, collegial-group influence, or task-related communication, respectively. Like job-career satisfaction, there was a residue of autonomy that was unexplained by variables of the model.